□□□□□□□□ -- □□□□□□□□□□□□□

□□ □□□

—— □□

Turing Test □□□□□□□ AI□A Modern Approach □□□□□□□□□□□□□□□□□□□□□□□□□ Nature □ AlphaGo Zero □□□□□□□□□□□□□□□□□□□□□□□□□□□□ [1]□

1949 □□□□□□□□□□□ leukotomy □□

□□□

□□□

□□□□ leukotomy □□□□□□□□□□□□□□□□□□□□□□□□□

□□Leukotomy □ BRIAN Initiative

Leukotomy □□□□□□□□□□□□□□□

1□□□□□□□□□□□□□□□ personalities □ mental diseases□□□□ personalities □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ BRAIN Initiative □□□□□□□ [2]□

2□□ leukotomy □□□□□□□□□□□□□□□□□ leukotomy □□□□□□□□□□□□□□□□□□□□□□□ BRAIN Initiative □□□□□□□□ AlphaGo □□□□□□□□□□□□□□□□□□□□

3□□□□ personality □ intelligence □□□□□□□□□□□□□□□ Walter Freeman □□□□□□□□□□□□□□□□□□ personality □ intelligence □□□□□□□□□□□□□□□□□□ [3]□

□□□□□ personality □ intelligence□□□□□□□□□□ personality □ intelligence □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□leukotomy □□

□□□□□□□□□□□□□□□□□□□ Turing Test □□□□□□□□Nature □ AlphaGo Zero □□□□□ superhuman □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ superhuman □□□□ generic □ human□□□□□□□□□□□□□□□□□□□□□□□□□□□□

Leukotomy □□□□□□□□□□□□□□ Nature □ AlphaGo Zero □□□□□ superhuman □□□□□□□□□□□□□□□□□□

 peer review Peer review [4]。

在 leukotomy BRAIN Initiative

四、Technological Singularity 与 AlphaGo

Nature AlphaGo Zero AlphaGo Zero superhuman 的 performance。这个 superhuman generic 的 human superhuman

AlphaGo Zero 相比 AlphaGo Master superhuman 的概念，AlphaGo Master generic 的 superhuman game

 AlphaGo Zero superhuman AlphaGo Zero

 game superhuman 的概念。

 Technological Singularity

 Deepmind [5]

AlphaGo Master AlphaGo Master AlphaGo Master AlphaGo Zero 相比 AlphaGo Master，所以 AlphaGo Master

 AlphaGo Zero AlphaGo Master AlphaGo Zero [6]AlphaGo Master 16 AlphaGo Zero 18 AlphaGo Zero 14、16 45

1 Nature Magazime AlphaGo Deepmind AlphaGo Zero 和 AlphaGo Master

2) AlphaGo Zero local trap AlphaGo Zero superhuman

所以 AlphaGo Zero 相比 AlphaGo Master AlphaGo Master AlphaGo Master AlphaGo Master [7]，Nature AlphaGo Zero AlphaGo Master deep-learning AlphaGo Master

□□□□□□□□□□□□□□□□□□ AlphaGo Zero [8]□□□□□□□□□□□□□□ superhuman □□□□□□□□□□□□□□□□□□□□□□□□ AlphaGo Zero □□□□□□□

□□□□ AlphaGo □□□□□□ generic human □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ Deepmind □□ AlphaGo □□□□□□□□□□□□□□□□□□□□□□□□□ AlphaGo □□ AlphaGo □□□□□□□□□□□□□

□□□ □□□□□□□□□□□□□□□□□□□□□ AlphaGo □□□□□□□ AlphaGo □□□□□□□□□□□□□□□□□□□□ [9]□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□□□□□□□ Turing Machine □□□□□□□□□□□□□□□□ AlphaGo □□□ AlphaGo Zero □ AlphaGo Master□□□□□□□□□□□□□□ AlphaGo Zero □ AlphaGo Zero □□□□□□□□□□□

□□ [10]□

□□□□□□□□□□□□□□□□

□□□Turing Machine □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ Turing Machine □□□□□□□□□□ Universal approximation □□□□□□□

□□□□□□□□□□□□□□□ Socratic method □□□

□□□□□□□□□□□□□□□□□□□ Karl Popper □□□ [11]□

□□

Neurosciences □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ human specific intelligence □□

□□□□□□□□□ Alan Turing□□□ Geoffrey Hinton□□□ Demis Hassabis□□□□□□□□□□□□□□□□□□□□□□AlphaGo □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

Demis Hassabis □□□□□□□□ deep-learning□reinforcement □□□□□□□□□□ [12]□□□ Nature □□□□□ AlphaGo Zero □□□□□ generic □ superhuman □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ Geoffrey Hinton □□□□□□□□□□□□□

Turing Machine □□□□□□□□□□□□□□□□□□□□□□□□□□ Turing Machine □□□□□□□ Geoffrey Hinton □□□□□□□□□□□ Turing Machine □□□□□□□□□ Alan Turing □□□□□□□□□□□□□□□□□

□□□

□□□□□□□□□□□□□□□ Dialogue Concerning the Two Chief World Systems [13]□□□

□□□□□□□□□□□□□□ The Sceptical of Chemist□□□

□□□□□□□□□□□□□□ On the Origin of Species□□□

□□ human specific intelligence□□ big data □□□□□□□□□□□□□□□ big data □□□□□□□□□BRAIN Initiative □□□□ big data □□□□□□□□□□□□□□ human specific intelligence □□□□□□□□□□□□□□□□□□□

Big data □□□ AlphaGo □□□□□□□□□□□□□□□□

□□□

□□□□□□□□□□□□□

□□□

□□□

□□

□□ [14]□

□□

□□□□□□ Karl Popper □□□

□□□

□□

□□ [15]□

□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Turing Test □□

□□□

□□□□□□□□□□□□□□□ ResNet □□□□□□Generative Adversarial Networks□Capsule networks □□□

□□□□□□AI: A Modern Approach □□ driverless Car□□□□ SAE level 5□□□□ human specific intelligence □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□ human specific intelligence □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□Technological Singularity □□□□□□□ [16]□□□□□□□□□□□□□□□□

□□□

□□□□□□□□□□□

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□

□□□

□□

□□ [17]□

□□□·□□

□□□□□□□□□□□□□□□□□□□□□

□□

□□·□□□□□□□□□□□□□□

□□

□□□

□□□ [18]□□ [19]□

□□□Technological Singularity□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□

□□

□□

□□□

□□

□□□

□□□□

□□□

□□

□□

□□

□□□Technological Singularity□AlphaGo Zero□superhuman □□ [20]□

~~~~~~~~~~

[1] AI□A Modern Approach □□□ "Aristotle... was the first to formulate a precise set of laws governing the rational part of the mind."(On page 5)□

Galileo Galilei □ Dialogue Concerning the Two Chief World Systems □□□□□□□□□□□□□□□□□□□□

Immanuel Kant

Gödel's theorems

 "a <u>precise</u> set of laws governing the rational part of the mind"。

[2] BRAIN Initiative mental diseases anxiety disorders like depression and post-traumatic stress disorder、obesity and eating disorders、bipolar disorder、and mental retardation disorders diseases

BRAIN Initiative personalities mental diseases Big Data

Down's syndrome BRAIN Initiative

[3] Leucotomy in England and Wales, 1942-1954 9284 41 28 25 2 4

 personality intelligence 25 personality intelligence clinical condition 41 28 clinical condition personality intelligence

leucotomy

Renato M.E. Sabbatini Even lobotomy's preponents admitted that only one third of the operated patients would improve, while one-third remained the same, and one-third got worst Leucotomy in England and Wales, 1942-1954 http://www.cerebromente.org.br/n02/historia/lobotomy.htm）。

one third would improve one-third remained the same clinical condition personality intelligence

 personality intelligence leucotomy BRAIN Initiative

[4]

peer review peer review

□□□AlphaGo Zero □□□□□ superhuman □□□□□□ generic □ human□□ AlphaGo Zero □□□□□□□□□□□□□□□

[5] □□□□ Cracking Go □□□□□□□□□□□□□□□□□□□□□□ Deep Blue □□AlphaGo □□ AlphaGo □□□□□□□□□□□□□□□□□□□□□□

[6] □□□ http://www.alphago-games.com/ □AlphaGo Zero □ AlphaGo Zero □□□□□□□□□□□□□ □□□□□□□ https://www.101weiqi.com/chessbook/player/38348/ □□□□□□□□

[7] AlphaGo Master □□□□□□AlphaGo Master □□ □□□□□□□□□□□□□□□□□□□□□□□□□

[8] http://www.alphago-games.com/ □□□Full Strength of Alphago Zero, i.e. Final Form□□□□□ 40 Blocks□20 Blocks □□□□ Not Full Strength of Alphago Zero□□□□□□□□□□□□□□ □ Alphago Zero □□□□□□□□□□

[9] □□□ □□□

□□ □□□□

□□□ AlphaGo □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ Google □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ AlphaGo □□□□□AlphaGo Zero□□□□□ AlphaGo □□ □□Human level artificial intelligence □□□□□□□□□ □□□□□□□□□□□□□□□□□□□□ AlphaGo □□□ □□□□□□□□□□□□□□□

□□□ □□□□□□□□□□□□□□

[10] □□□□□□□□□2012 □□□□□□□□□□□□□□□□□□2015 □□ □□

□□□□□□:"Go gaming is strictly defined within a very small space. Industrial automations are typically designed in well controlled environments, but not strictly defined. Car driving is regulated, but the environment is not well controlled"□□□□□ □□

□□ □□□

□□ □□

[11] □□

□□

[12] □□□□□□□□□□□□□□□□□□□□□□□·□□

□ deep-learning□reinforcement □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ AlphaGo Zero □□□□□□□□□□□□□
□□

[13] Dialogue Concerning the Two Chief Word Systems □□□□□□□□□□□ Socratic Method □□
□□□

□□□·□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

□□□
□□□□□□

□□□

[14] □□□□□□□□□□□□□□□□□□ talent pool □□□

□□□ talent pool □□

[15] Personal computers□Internet□smartphones □□□ digital cameras□GPS□smart wearables□virtual reality□quantum computer □□□□□□□□□□□

□□

[16] □□□□□□□□□□□□□□□□□□□□□□□□□□□□□Universal approximation □□□□□□□Technological Singularity □□□□□□□□□□□□□□□□AlphaGo Zero □ superhuman □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

[17] □□□□□□□□□□□□□□□□□□□□□□□□□□□□ 1819 □□□□□□□□ Ferdinand Schweikart □□

□□□□□□□□□□□□□□□□□□□□□□□□ 1830 □□

□□□□□□□□□□Ferdinand Schweikart □□□

[18] □□□□□□·□□□□"□□□"

[19] □□